

MONTHLY REPORT OF RIVER/FLOOD CONDITIONS

TO: NATIONAL WEATHER SERVICE
HYDROMETEOROLOGICAL INFO CENTER
1325 EAST-WEST HIGHWAY
SILVER SPRING, MD 20910

| REPORT FOR:
| March 2011

| Date: 4/6/11

|Signature: Peter Corrigan

Summary: March began with a huge turnaround from the dry winter of 2010-2011 as several very wet storms in the first 10 days produced some minor river and small stream flooding (see E-3 table below) across parts of the Blacksburg Hydrologic Service Area (HSA). In the aggregate however, the rainfall was a huge benefit in terms of improving the drought status in the region. The mean monthly precipitation (72 NWS Cooperative and ASOS stations) was 6.06" versus the March long-term mean of 4.14" (1971-2000 data) or 146 percent of average. It was the wettest March in the Blacksburg HSA since the WFO has kept such records beginning in 1996. Monthly totals ranged from a low of 2.64" at Altavista (ALTV2) in Campbell County, VA to a high of 10.29" at Woolwine (WWLV2) in Patrick County, VA. Much of the month was very mild with record warmth shortly after mid-month being offset somewhat by a chilly end. Monthly means at climate sites ranged from a low of 42.8°F at Blacksburg (+1.4°) to a high of 48.6°F at Danville (+0.7°).

A storm that began on the last day of February brought moderate rainfall across the entire HSA, ranging from 0.75" across the piedmont up to 2.00" in the far western sections. 24-hour rain gage totals ending at 12Z on March 1st were highest across the Mountain Empire and included 2.24" at Fairwood IFLOWS (FWDV2), 2.08" at Springville IFLOWS (SPIV2), 1.96" at both Jones Knob IFLOWS (JNKV2) and Grayson Highlands IFLOWS (GYHV2), and 1.90" at Troutdale COOP (TROV2). Despite fairly dry initial conditions (DO conditions on U.S. Drought Monitor) there were sharp rises on several rivers streams mainly in the Tennessee River basin. The Clinch River at Richlands (RLRV2) in western Tazewell County hit 9.60 feet, just below the minor flood stage of 10 feet. This was the highest level on this gage since May 25, 2004 (10.37'). Both the North and South Forks of the Holston River in Smyth County rose to near action stage. Areal Flood Warnings were issued late on the 28th into the early morning of March 1st for parts of Grayson, Smyth and Tazewell counties as streams were reported out of banks and affecting some roadways.

The next significant event occurred March 6-7, brought on by a strong southern stream short wave and deep upper trough which became negatively tilted as it moved into the southern Appalachians. Low pressure developed along the associated cold front, slowing its eastward progression and prolonging the duration of moderate to heavy rain across the area. Strong low-level southeast flow provided enhanced upslope precipitation into the Blue Ridge, and also the higher Allegheny ridges in far western Virginia. A Flood Watch was issued early on the 5th of March as this system approached the area and the first Flood Warning for small streams was issued in the early morning hours (430 AM) of the 6th for Giles County, VA. Later Flood Warnings were issued throughout the day to cover nearly every mountain and foothills county and city across all three states covered by the Blacksburg HSA. Despite this, reported impacts were fairly modest with only some road closures reported. In the 24 hours ending at 12Z on the 6th rainfall amounts

were generally about 1 to 3 inches in the mountains, with much less over the piedmont. Rainfall continued through much of the 6th so that final rainfall totals were 3 to 5 inches in the mountains and 1 to 2 inches in the piedmont (See Fig. 1 below). Table 1 shows the top ten rain gage amounts. Rainfall rates were not especially high throughout the event, running mainly 0.20 inches per hour or less at most gages, although rates of 0.50" per hour were observed at some favored upslope gage locations. The relatively low rates caused streams to rise more slowly as well, and no Flash Flood Warnings were issued as a result. By mid-afternoon several River Flood Warnings were issued including Walker (BANV2) and Wolf (WOLV2) Creeks in Giles County and for the Yadkin River at Elkin (ELKN7). Additional River Flood Warnings were later issued for the New River at Radford (RDFV2), Greenbrier at Alderson (ALDW2) and at several forecast points along the both the Roanoke and Dan Rivers as well as for Bremono Bluff (BREV2) on the James River. Even with the sharp rises that occurred most of the forecast points crested somewhat lower than forecast and only a handful even reached Minor Flood Stage (see E-3 portion of this report below for crest information).

Figure 1. 48-hr MPE (grid) rainfall ending 1200Z, March 7, 2011

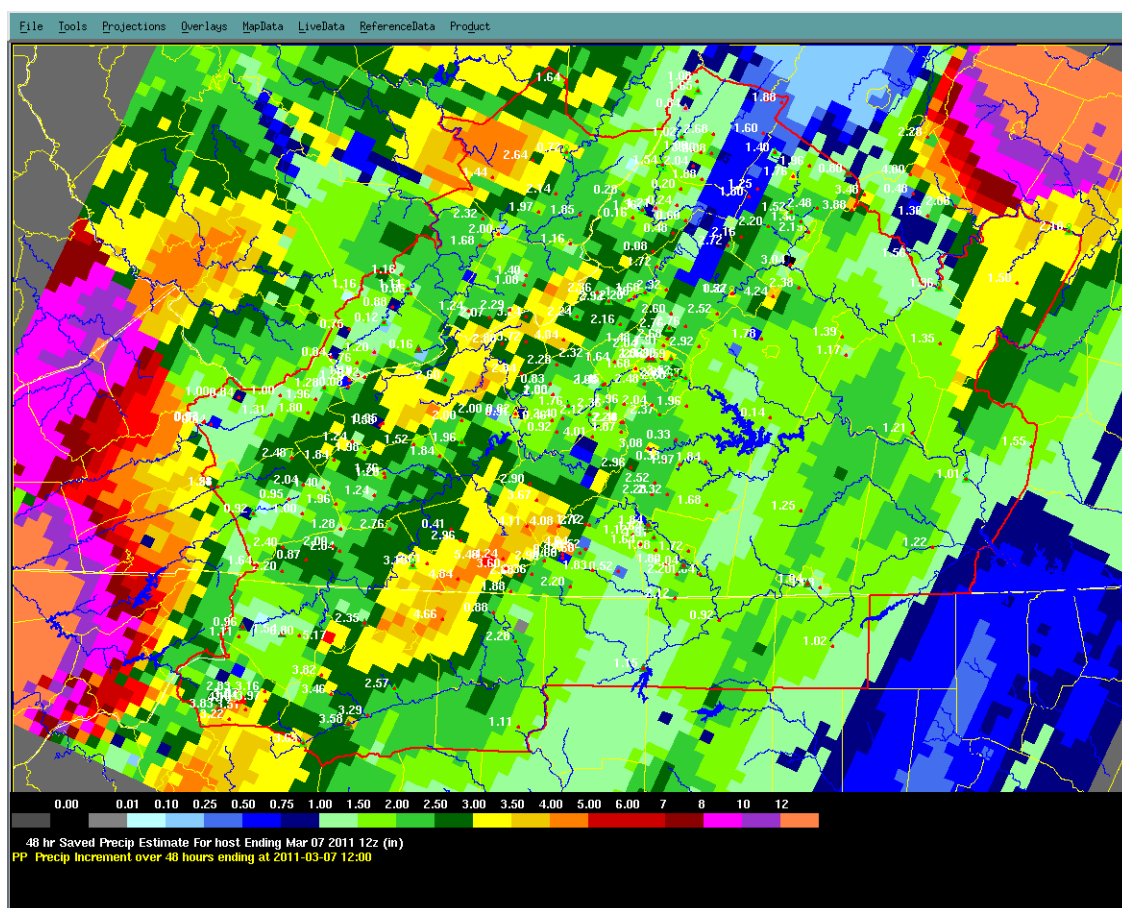


Table 1 – Top ten 48-hour precipitation amounts: RNK HSA – ending 12Z, March 7, 2011

SHEF ID	Station	County	Type	Precipitation
FYGV2	Fancy Gap	Carroll	IFLOWS	5.48
LRLN7	Laurel Springs	Wilkes	RAWS	5.17
PPGV2	Pipers Gap	Carroll	IFLOWS	4.84
RAVN7	Raven Knob	Surry	RAWS	4.66
CIRV2	Circle M	Patrick	IFLOWS	4.64
GLDV2	Gladesboro	Carroll	IFLOWS	4.24
APEV2	Apple Orchard	Botetourt	IFLOWS	4.24
BFMV2	Buffalo Mtn.	Carroll	IFLOWS	4.11
BONN7	Boone (TVA)	Watauga	DCP	4.10
SLAV2	Slate Mtn.	Patrick	IFLOWS	4.08

After about a one-day break, another storm began to affect the area on early on the 9th as a storm developed over the central U.S. and lifted north into the Great lakes pulling a slow-moving cold front across the area. A Flood Watch was issued early on the 8th in anticipation of this event with forecast rainfall amounts of 1 to 3 inches, and locally higher amounts forecast to fall on the 9th and 10th. Due to strong model agreement there was high confidence in the precipitation forecasts and with many rivers already running high along with saturated ground, a significant river flood event was expected. Flood Warnings were issued on the morning of the 9th for most of the forecast points in the Roanoke, Dan and James River basins, based almost entirely on this forecast rainfall. Heavy rains began to arrive in the far western HSA in the early afternoon of the 9th and areal Flood Warnings were issued for several counties in the Tennessee and New River basins. The only Flash Flood Warning of the month was issued for portions of Rockbridge, Botetourt and Amherst counties (including Lexington and Buena Vista) during the afternoon of the 9th as stronger storms developed ahead of the cold front and produced more intense rainfall. Overall rainfall amounts were considerably less than forecast however as convection well to the south apparently intercepted the northward inflow of moisture. Basin-average 24-hour rainfall ending at 12Z on the 10th across the HSA ranged from 0.75 to 1.25 inches, compared to QPF forecasts that ranged from 2 to 3 inches made on the 9th. Only five rain gages picked up as much as 2 inches for the period, including Glasgow COOP (GLAV2) 2.73", Woolwine COOP (WLWV2) 2.12", Little River/Sparta IFLOWS (SPAN7) 2.06", Wilbar DCP (WLBN7) 2.05" and MF New River IFLOWS (NERN7) 2.04". The result was that almost none of the rivers forecast to reach Flood stage did so, although a few did reach Action stage. The exception was the James River at Bremono Bluff (BREV2), which crested a few feet above flood stage on the 12th.

The remainder of March was comparatively quiet with several minor precipitation events, the most significant of which occurred on the March 23-24. Two lines of storms moved across in the afternoon and again overnight with pockets of heavy rain and some severe storms. 24-hour rainfall ending 12Z on the 24th was typically sporadic for convection, with amounts ranging from as little as 0.25 up to 1.75 inches in some storms over the North Carolina piedmont. The strong frontal passage brought an abrupt end an extended period of warmth that saw several record high temperatures established. Much colder temperatures and scattered mountain snow showers dominated the last week in the month. Despite the overall wet month, drought conditions in parts of the area were still persisting as of the issuance of the March 29 U.S. Drought Monitor. Moderate Drought (D1 category) was confined to an area along and east of a line from Caswell County, NC north through Pittsylvania, Campbell and Amherst counties in Virginia. Abnormally Dry (D0) conditions were still depicted from Rockingham County, NC northward through Craig County, VA.

NWS FORM E-3 U.S. DEPARTMENT OF COMMERCE NOAA, NATIONAL WEATHER SERVICE FLOOD STAGE REPORT		HYDROLOGIC SERVICE AREA: Blacksburg, VA (RNK)				
		MONTH: March YEAR: 2011				
RIVER AND STATION	FLOOD STAGE (FEET)	ABOVE FLOOD STAGE		CREST		
		FROM	TO	STAGE (FEET)	DATE	TIME (UTC)

Dan River

South Boston (SBNV2)	19	3/8/11	3/8/11	19.00 (E)	3/8/11	0900
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James River

Bremo Bluff (BREV2)	19	3/8/11	3/8/11	19.20	3/8/11	1530
		3/11/11	3/12/11	21.50	3/12/11	0230

New River

Radford (RDFV2)	14	3/7/11	3/7/11	14.36	3/7/11	0400
Walker Creek at Bane (BANV2)	11	3/6/11	3/7/11	13.76	3/7/11	0200

Yadkin River

Elkin (ELKN7)	16	3/6/11	3/7/11	19.16 (E)	3/7/11	0115
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(E) – Estimated Stages due to gage outages/problems

Non-Routine Hydrologic Product Summary (Mar):

Flood/Flash Flood Watches (FFARNK): 4
 Flood Advisories (Urban/Small Stream - FLSRNK): 1
 Flash Flood Warnings (FFWRNK): 1
 Areal Flood Warnings (FLWRNK): 21
 River Flood Warnings (FLWRNK - forecast points): 19